



## *Schistura fasciata*, a new nemacheiline species (Cypriniformes: Balitoridae) from Manipur, India

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**Author Details:** Y. LOKESHWAR is a Junior Research Fellow under a project funded by the Ministry of Environment & Forests, New Delhi. He is working on the inventory of the nemacheiline loaches of northeastern India. He is undergoing PhD on a relevant topic in the Department of Life Sciences, Manipur University. W. VISHWANATH is a Professor in the Department of Life Sciences, Manipur University. His field of specialization is fish and fisheries. He is presently engaged in taxonomy and systematics of freshwater fishes of northeastern India.

**Author Contribution:** see end of this article.

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**Abstract:** A new nemacheiline fish, *Schistura fasciata* sp. nov. is described here from Barak River (Brahmaputra Drainage) of Manipur, India. The species is characterized by 11-13 dark brown transverse bars on the flank, moderately high adipose crest on dorsal and ventral side of caudal peduncle, three prominent dark spots at the base of dorsal fin, dorsal fin with 8½ branched rays and an incomplete lateral line.

**Keywords:** Barak River, Nemacheilinae, new fish.

## INTRODUCTION

Fishes of the genus *Schistura* McClelland are small, hill stream fish with medially interrupted lower lip without forming two lateral triangular pads; moderately arched mouth, 2.0-3.5 times wider than long; usually a black bar (sometimes dissociated) on caudal fin base; dorsal fin with one or two black marks along its base (Kottelat 1990; Vishwanath & Laishram 2001). Eight species of the genus *Schistura* have been described from two major drainages of Manipur, a hilly state in northeastern India, namely, *S. manipurensis* (Chaudhuri, 1912), *S. kangjupkhulensis*, *S. prashadi*, and *S. sikmaiensis* (Hora, 1921), *S. tigrinum* (Vishwanath & Nebeshwar, 2005), *S. reticulata* (Vishwanath & Nebeshwar, 2004), *S. khugae* (Vishwanath & Shanta, 2004a,b), and *S. minutus* (Vishwanath & Shantakumar 2005).

Collections from the Barak River (Brahmaputra Drainage), draining the western side of Maram Hill, Senapati District, Manipur included specimens of *Schistura* which do not fit into the hitherto described species of the genus, and is therefore described as a new species, *Schistura fasciata*.

## MATERIAL AND METHODS

Fish were collected by electro-fishing technique using a DC battery. Colour in fresh state was noted before fixation and preservation in 10% formalin. Measurements were made point to point with dial calipers to the nearest 0.1mm and expressed as percentages of standard length (SL). Subunits of head are expressed as proportions of the head length. Numbers in parentheses following meristic data indicate number of specimens examined with that count. Counts and measurements were made on the left side of specimens and followed Kottelat (1990). The specimens are deposited in the Manipur University Museum of Fishes (MUMF).



**Image 1.** *Schistura fasciata* sp. nov.  
 a - Side view of Holotype, female, MUMF 11010, 51.5mm SL; b - Paratype, male, MUMF 11020, 68.3mm SL

***Schistura fasciata* sp. nov.**  
 (Image 1 a & b)

**Material examined**

**Holotype:** Female, 21.vi.2009, Barak River at western side of Maram Hill, Senapati District, Manipur (25°23'24.66"N & 94°04'09.25"E), coll. Y. Lokeshwor, MUMF 11010, 51.5mm SL.

**Paratypes:** 18 females, 37.5-59.9 mm SL, MUMF 11001-11019; 2 males, 59.2-68.3 mm SL, MUMF 11020-11021. Same data as holotype.

**Diagnosis**

A species of *Schistura* with the combination of characters: 11-13 dark brown transverse bars against pale yellow background on the body, bars arranged regularly, often fused on mid-dorsal line, width of bar broader than the interspace width; moderately high adipose crest on dorsal and ventral sides of caudal peduncle; lateral line incomplete, reaching vertical to posterior end of anal fin base; three black spots on base of dorsal fin; head short (12.72-16.41 % SL), dorsal fin with 8½ branched rays; processus dentiformes large.

**Description**

Morphometric data are shown in Table 1. Body

small and moderately elongated. Anterior section of the body circular and slightly compressed posteriorly. Head short about 18.6-22.7 %SL, slightly depressed with less inflated cheeks. Male has prominent inflated cheeks (Image 1b). Dorsal adipose crest moderately high extends from posterior extremity of dorsal fin base to caudal origin. Pectoral extends up to half the length of the distance between pectoral and pelvic fin origins. Auxiliary pelvic fin lobe is present; pelvic fin slightly behind the origin of dorsal fin, opposite to the first branched dorsal fin rays. Dorsal fin inserted half way between the origin of pectoral and anal fin. Caudal fin is emarginated.

D. 3/ 8½; A. 3/5½; C. 9+8; P. 11; V. 8.

Body covered by embedded non-overlapping scales. Lateral line incomplete extends to vertical of the posterior end of anal fin base. Cephalic lateral line system with 10 supraorbital, 4+9 infraorbital, 10 preoperculo-mandibular and three supratemporal pores.

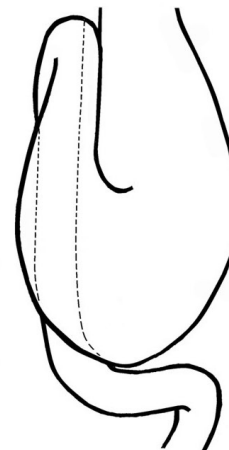
Nostril is situated nearer to anterior margin of eye, anterior nostril at the tip of a pointed flap like tube with a deeply notched anterior rim. Mouth moderately arched, upper lip straight with shallow median incision, lower lip with a deep median furrow (Image 2). Strong processus dentiformes present. Inner rostral barbel

**Table 1. Morphometric data of *Schistura fasciata* sp. nov.**

	Holotype MUMF 11010	Paratypes MUMF 11001-21 (N=20)
	Mean (Range) ± SD	
Standard length (mm)	51.5	49.3 (37.5-68.3) ± 7.4
% SL		
Body depth	14.8	14.9 (12.7-16.4) ± 1.2
Head depth at supra-occipital	11.9	11.4 (10.2-12.3) ± 0.6
Lateral head length	25.0	23.4 (21.2-25.4) ± 1.1
Dorsal head length	22.7	21.3 (18.6-22.7) ± 1.2
Head depth at eye	10.1	9.7 (8.9-10.8) ± 0.4
Caudal peduncle length	15.2	14.1 (12.3-15.2) ± 0.8
Caudal peduncle height	11.7	12.4 (11.1-13.5) ± 0.6
Pre-dorsal length	52.1	52.5 (49.7-63.7) ± 2.7
Pre-pelvic length	52.0	53.2 (51.1-54.9) ± 1.0
Pre-anus length	72.2	75.1 (72.2-80.3) ± 1.7
Pre-anal length	77.6	78.9 (76.5-80.9) ± 1.1
Dorsal fin height	15.4	13.8 (12.1-15.6) ± 1.1
Pelvic fin length	17.1	15.6 (13.6-17.7) ± 1.0
Anal fin length	16.1	14.2 (12.7-16.1) ± 0.9
Pectoral fin length	19.4	17.3 (14.7-19.4) ± 1.2
Max. head width at cheek	15.7	14.3 (12.6-14.8) ± 0.9
Head width (at nares)	10.7	10.1 (8.4-11.0) ± 1.0
Body width at anal fin origin	6.7	7.2 (6.0-8.4) ± 0.6
Body width at dorsal fin origin	11.6	11.9 (10.5-13.6) ± 0.9
% HL		
Snout length	45.7	47.6 (40.6-55.5) ± 3.9
Interorbital distance	27.5	28.6 (25.06-34.83) ± 2.5
Eye diameter	19.5	20.2 (17.5-24.0) ± 1.8
Mouth gape width	34.1	36.7 (31.2-45.2) ± 4.1

shorter than the outer one and reaches half way the distance from the anterior extremities of the body to anterior rim of nostril. The outer rostral barbel reaches the anterior margin of orbit. Maxillary barbel extends to the lower margin of orbit. Head longer than depth of the body, its width at nares is half of its lateral length. Eyes are moderate, dorsal in position and completely invisible from ventral side. Mouth gape is wide and about half of body depth. Intestine is with a small loop just behind stomach (Fig. 1).

**Sexual dimorphism:** Males are with swollen anterior body, triangular head and faintly coloured vertical bars especially visible from the middle of the dorsal fin to the base of the caudal fin whereas females

**Image 2. Lips of *Schistura fasciata* sp. nov.****Figure 1. Intestinal loop of *Schistura fasciata* sp. nov. Scale bar = 1mm**

have well distinct marked vertical bars. The dorsal surface of males is straight horizontally and with a well develop prominent dorsal adipose crest. The anterior dorsal profile of females are well arched and the adipose dorsal crest not prominent as in male.

**Colouration:** In live, body faintly golden to grey with 11 to 13 olivaceous dark brown vertical bars. Colour pattern and number of bars are more or less variable with a unique arrangement. 5-6 bars are on the pre-dorsal, 3 in dorsal and 4-5 bars on the post-dorsal. Bars on the pre-dorsal are broader than the posterior ones. They are united mid-dorsally and their inter-bands are wider towards the posterior. All the rays of the dorsal, ventral, pectoral and anal fins are with a row of faintly black elongated marks. A complete dark caudal bar with forward and backward projections present on the base of caudal fin. Three

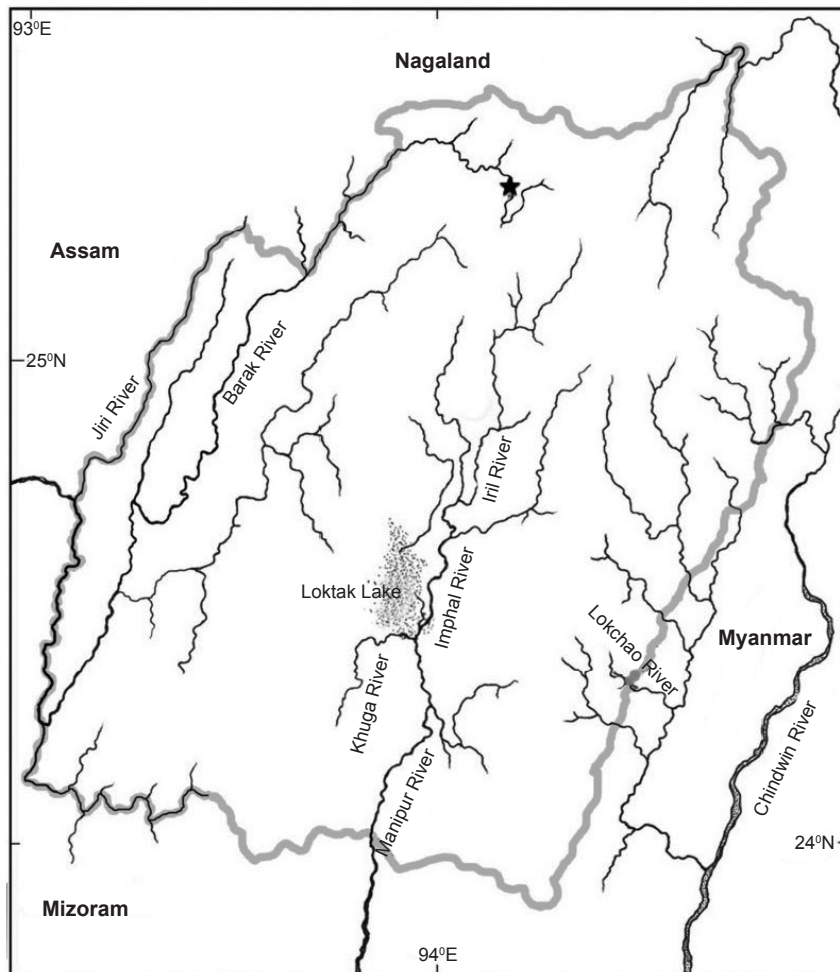


Figure 2. Map of Manipur showing type locality of *Schistura fasciata* sp. nov.

prominent black spots on the base of the dorsal fin; respectively extending from simple rays to 1<sup>st</sup> branched ray, from 3<sup>rd</sup> to 5<sup>th</sup> branched rays and from 7<sup>th</sup> to last branched rays. Distal margin of fins golden. Head dark olivaceous dorsally, becoming lighter on sides.

In 10% formalin, body becomes lighter with the loss of golden colouration in the interspace of vertical bars and on the distal margin of fins. The olivaceous dark brown bars turn to light dark grey colouration.

**Etymology:** The fish has been named after its dark brown bars on body. Latin 'fasciata' = banded.

**Distribution and Habitat:** The species are known only from the type locality, Barak River at the western side of Maram Hill, Senapati District, Manipur (Fig. 2). The fish inhabits the pebbly bottom of large, swift flowing streams (Image 3).

## DISCUSSION

*Schistura fasciata* sp. nov. is close to *S. khugae*, *S. tigrinum* and *S. multifasciatus* in colour pattern. But



Image 3. Habitat of *Schistura fasciata* sp. nov. and electrofishing with locally designed equipment.

Key to species of the genus *Schistura* of Manipur

1. Lateral line complete ..... 2  
Lateral line incomplete ..... 4
2. Lower lip with broad triangular pad ..... *S. prashadi*  
Lower lip without broad triangular pad ..... 3
3. Body with 17-27 bars, reticulated anteriorly ..... *S. reticulata*  
Body with 8-11 bars, not reticulated ..... *S. chindwinica*
4. Branched dorsal fin rays: 8½ ..... 5  
Branched dorsal fin rays: 7½ ..... 9
5. Body with 11-16 bars ..... 6  
Body with 18-30 bars ..... 7
6. Caudal fin branched rays: 15, bars on body: 10-11, bars wide, interspace: ¼ of the bar width .....  
..... *S. nagaensis*  
Caudal fin with 17 branched rays, bars on body: 11-16, bars narrow, interspace: ⅓ of the bar width..... 10
7. Caudal fin slightly emarginate, bars on body: 18, anal fin with two simple rays ..... *S. minuta*  
Caudal fin forked or deeply emarginate, bars on body: 18-30, anal fin simple rays: 3 ..... 8
8. Caudal fin deeply emarginate, bars on body: 18-30, anal fin simple rays: 3 ..... *S. tigrinum*  
Caudal fin forked, bars on body: 17-21, anal fin simple rays: 2 ..... *S. sikmaiensis*
9. Body with 7-11 regular bars, caudal fin branched rays: 15, no colour spot on fins ..... *S. kangjupkhulensis*  
Body with 17-21 irregular bars, caudal fin branched rays: 15, dorsal and caudal fins with unevenly arranged spots ..... *S. manipurensis*
10. Body with 15-16 bars, a black spot at dorsal fin base, anal fin simple ray: 1 ..... *S. khugae*  
Body with 11-13 bars, three black spots at dorsal fin base, Anal fin simple rays three.....  
..... ***S. fasciata* sp. nov.**

it can be distinguished from its congeners in having 11-13 colour bars (vs. 15-30), moderately long caudal peduncle (12.3-15.2) (vs. 12.4-20.0)% of SL, three spots on the base of the dorsal fin (vs. 0-2), moderately long pectoral fin (14.7-19.4) (vs. 15.5-22.7)% of SL, longer pre-anus length 72.2-80.3 (vs. 70.3-75.0)% of SL, moderately high dorsal fin 12.1-15.6 (vs. 11.7-18.0)% of SL, moderate body depth 12.7-16.4 (vs. 10.0-18.6)% of SL, large eye 17.5-24.0 (vs. 15.1-20.5)% of HL.

*Schistura fasciata* sp. nov. can be distinguished from *S. khugae* Vishwanath & Shanta (2004 a,b) of Khuga River (Chindwin Drainage), in having less number of bars on body (11-13 vs. 15-16), three black spots (vs. 2) on dorsal fin base, straight upper lip with median incision (vs. without median incision) and three unbranched simple anal fin rays (vs. 1) and in the extent of lateral line up to posterior end of anal fin (vs. vent or anal fin origin).

The new species can easily be distinguished from *S. tigrinum* Vishwanath & Nebeshwar (2005) of Barak River in having less number of vertical body bar (11-13 vs. 17-30), presence of black spots at the dorsal fin base (3 vs. nil) and the number of ventral fin rays (8 vs. 7).

Day (1878) described *Nemacheilus multifasciatus* (now *Schistura*) from Darjeeling and Assam. The type in ZSI was examined but found to be in a poor state of preservation and not suitable for comparison. Thus comparison was made based on data of Day (1978) and Menon (1987). *Schistura fasciata* sp. nov., differs from *S. multifasciatus* in having three simple dorsal fin rays (vs. 2), 8½ branched dorsal fin rays (vs. 7½), 11 pectoral fin rays (vs. 12), three simple anal fin rays (vs. 2), 5½ branched anal fin rays (vs. 5), eight ventral fin rays (vs. 9), 17 branched caudal fin rays (vs. 18) and incomplete lateral line (vs. complete lateral line). The vertical bars in *S. fasciata* sp. nov. are more or less equal in thickness and fewer in number (11-13) however in *S. multifasciatus* they are thinner and numerous to the anterior than the posterior and about (18-30).

## Comparative Materials

*Schistura tigrinum*, holotype, 95.3mm SL, MUMF 4105; 2005, paratypes, 2 specimens, 81.6-86.1 mm SL, Barak River at Khunphung, Tamei subdivision, Tamenglong District, Manipur, India, coll. Nebeshwar Sharma, MUMF 4106/7.

*Schistura khugae*, holotype, 67.0mm SL, MUMF

5013; 08.iv.2000, 8 specimens, 58.0-96.5 mm SL, Khuga River, Chindwin Drainage, Churachandpur District, Manipur, India, coll. K. Shanta Devi, MUMF 5001-5008.

*Schistura multifasciatus*, holotype, Darjeeling, India, ZSI F2677/1 (poor state of preservation).

**Author Contribution:** The study: YL survey, collection, morphometric and anatomic study of nemacheiline fishes of northeastern India and their phylogenetics; WV supervision of taxonomy and phylogeny of freshwater fishes of northeastern India. Current paper: YL detailed examination of the nemacheiline fishes of the Barak and its tributaries in Manipur and comparison with specimens in ZSI, Kolkata and in MUMF. WV supervision in establishing new species and discuss taxonomic status.

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